

## ABSTRACT

An oxygen fired power generation system is disclosed. The power generation system has a high pressure combustor having a water recycle temperature control subassembly, and an intermediate pressure combustor having a CO<sub>2</sub> recycle temperature control subassembly. Thus, a first energy cycle utilizes a first energy source operatively associated with a corresponding first heat sink, and a first inert agent to provide energy transfer therebetween and temperature control during operation of the first energy source. In like fashion, a second energy cycle utilizes a second energy source operatively associated with a corresponding second heat sink, and a second inert agent to provide energy transfer therebetween and temperature control during operation of the second energy source. The first and second energy sources are not identical, the first and second heat sinks are not identical and the first and second inert agents are not identical. The first and second energy cycles are configured in combination to provide a power generation unit.